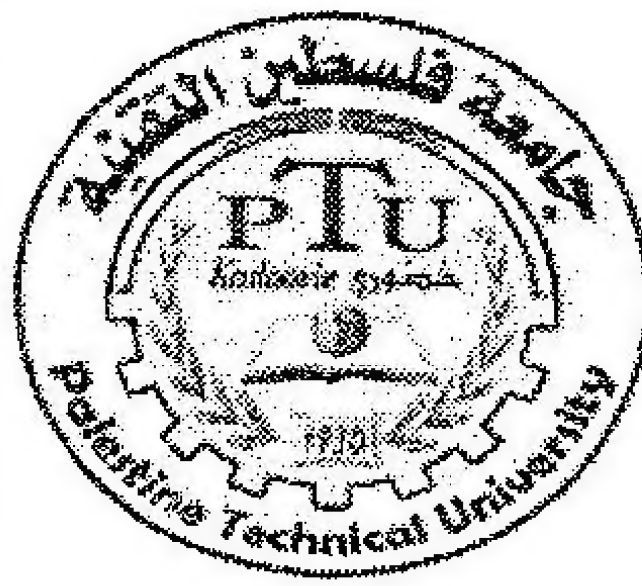


تم ارفع بواسطه
م. معن ابو عيسى

احكام وصغرات عشوائيه - نهائي

Specialization:	Electrical Engineering
Course Name:	Probability and Random Variables for Engineers
Date:	29/05/2011
Time:	11:00-13:00
Instructor:	Dr. Mutamed Khatib



Palestinian National Authority
Ministry Education & Higher Education
Palestine Technical University
College of Engineering & Technology

Final Exam
2nd semester 2010/2011

1. (5 marks) The probability generating function for a random variable X is given by:

$$g_X(z) = \frac{z^{10} + z^{20}}{2}$$

Find $E(X^2 + 1)$

2. (5 marks) Suppose that X , Y and Z are independent random variables with $X \sim N(1, 4)$, $Y \sim N(2, 9)$ and $Z \sim N(3, 16)$, Find $P(2X - Y + Z > 5)$

3. (5 marks) Suppose that the RV W has a moment generating function

$$M_X(t) = e^{-2t + 4t^2}, \text{ find } E(W).$$

4. (5 marks) The probability density function for (X, Y) is given by:

$$f_{X,Y}(x, y) = \begin{cases} 1 & 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & \text{else} \end{cases}$$

Find the cumulative distribution function for the random variable $Z = X + Y$

5. (5 marks) Let (X, Y) be a continuous random vector with joint probability density function given by:

$$f_{X,Y}(x, y) = \begin{cases} 4xy & 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & \text{else} \end{cases}$$

Find $P(X > 0.5 | Y \leq 0.5)$

6. Let X be a random variable with probability density function:

$$f_X(x) = \begin{cases} \frac{2}{x^2} & 1 \leq x \leq 2 \\ 0 & \text{else} \end{cases}$$

Let F denote the cumulative distribution function of X .

(a) (5 marks) Compute $F(-11)$

(b) (5 marks) Find $E[X]$

7. (5 marks) Let X be a continuous random variable having the probability density function:

$$f_X(x) = \begin{cases} 1.5(1 - x^2) & 0 \leq x \leq 1 \\ 0 & \text{else} \end{cases}$$

Find $P(X \geq 0.5)$

Good luck